

### **REMARKS**

Claims 12-25 and 35-47 are now pending in the application. Claims 35-47 have been added by this amendment. Claims 1-11 and 26-34 have been cancelled by this amendment. Minor amendments have been made to the specification to simply overcome the objections to the specification. The amendments to the claims contained herein are intended to broaden the scope thereof or are of equivalent scope as originally filed and, thus, are not a narrowing amendment. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

### **ELECTION/RESTRICTION REQUIREMENT**

Applicants note that the Examiner has made final the election requirements. Although Applicants submit that there would not be a significant burden to examine each of the presently pending claims, even if they are directed to different inventions, Applicants have cancelled claims 1-11 and 26-34 to expedite prosecution of the present application. Further, canceling these claims has rendered the rejection requirement moot.

### **SPECIFICATION**

The specification stands objected to for certain informalities. Applicants have amended the specification; therefore, reconsideration and withdrawal of this objection are respectfully requested.

Support for "aperture" can be found throughout the specification as filed, including Claim 13. Nevertheless, to overcome the objection to the specification, paragraph 44 has

been amended to indicate that various portions, such as the orifice 94, can also be referred to as an aperture.

Support for having an internal angle of about 4° to about 20° can be found throughout the specification as filed, including that a half angle can be defined between 2 and 20°. It will be understood that a whole angle, therefore, can be about 4° to about 40° and an internal angle can be in a range, such as about 4° to about 20. Nevertheless, paragraph 51 has been amended to recite that the injector nose 106 can include an internal angle of about 4° to about 20°, and support therefore can be found throughout the specification as filed including Claim 20.

#### **CLAIM OBJECTION**

The Office Action indicated an objection to the claims in the specification for including the term “splash plate” because the drawings made reference to a portion indicated as reference No. 102 in Fig. 8.

Applicants submit that the definition of “plate” is not limited to only a thin piece of material. Rather, as indicated in the included definition of plate from the American Heritage College Dictionary Third Edition (Tab A), plate can have a plurality of meanings that can include a smooth flat rigid body, a flat piece of metal, or many other definitions. The Applicants do not wish to be limited to any particular definition of the term plate other than that provided in the specification and what one generally skilled in the art would understand it to be. Nevertheless, Applicants submit that the definition of plate is not as limited as the Office Action indicates and that the definition of a plate can include a flat surface, a ridged surface, or other features. Nevertheless, to expedite prosecution of the

present application, independent Claim 12, Claim 13, Claim 15, Claim 16, Claim 17, and Claim 22 have been amended to recite “splash surface”. Applicants submit that amending the claims to delete “splash plate” to have them recite – splash surface – is at least of equivalent scope, if not broader scope, than the claims as originally filed. Therefore, the present amendment is a non-narrowing amendment and is provided simply to expedite prosecution of the present application.

#### **REJECTION UNDER 35 U.S.C. § 103**

Claims 12, 13, 15, 16, 17, 22, 23, 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carlisle (U.S. Pat. No. 3,142,961) in view of Amann (U.S. Pat. No. 3,785,145). Claims 12, 13, 15, 16, 17, 22, 23, 24 and 25 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shekelton et al. (U.S. Pat. No. 4,970,865) in view of Amann (U.S. Pat. No. 3,785,145). These rejections are respectfully traversed.

Carlisle is directed to a gas turbine engine that includes a round injection port 26 that can inject fuel onto a plate 27 and includes a large air duct 22 to allow air to pass into a combustion chamber 13. Carlisle does not teach an injector slot near an oxidizer pathway.

Amann simply describes that a regenerator 7 can be used to heat compressed air. Amann does not teach or fairly suggest an injector slot or a splash surface for any portion. The system of Amann only describes portions that are outside of a combustion chamber.

Shekelton et al. is directed to a spray nozzle that includes an atomizer means 24 which is illustrated to only be a conical spray nozzle and a separate surface 34 which an auxiliary portion of fluid can impinge. Shekelton et al. does not teach or fairly suggest an injector slot near an oxidizer pathway or an oxidizer pathway.

Independent Claim 12 recites "an injector for injecting a fuel into a gas powered turbine, comprising: . . . an oxidizer supply to supply a selected oxidizer to said combustion chamber; a pre-heat section to heat the oxidizer to a first temperature; an oxidizer pathway . . . an injector slot . . . a splash surface to spread the volume of the fuel in said injector slot". None of the references, either alone or in combination, teach or fairly suggest an injector slot near an oxidizer pathway, as recited in independent Claim 12. Even assuming that Carlisle and Shekelton et al. describe any of the portions of the recitations of independent Claim 12 save the pre-heat section, these references, either alone or in combination, do not teach or fairly suggest an injector slot near an oxidizer pathway. Therefore, neither Carlisle nor Shekelton et al. teach or fairly suggest each of the elements submitted in the Office Action. Therefore, Carlisle and Shekelton et al., either alone or in combination, cannot teach or suggest each of the elements of presently pending independent Claim 12 in combination with Amann.

Further, Applicants submit that there is no suggestion in the art to combine Amann with Carlisle or Shekelton et al. Carlisle and Shekelton et al. are merely directed to injection systems for a combustion engine, in particular a spray nozzle. Amann is directed to a power plant system and does not teach or suggest this combination with any injector nozzles or injector systems. Even assuming that Amann could be used with either Carlisle or Shekelton et al., there is no teaching or suggestion

in the art to combine Amann with Carlisle or Shekelton et al. to teach each of the elements of the presently pending claims.

Further, Applicants submit that many of the presently pending dependent claims, that depend directly or indirectly from independent Claim 12, include patentable subject matter in and of themselves. For example, dependent Claim 13 recites “an injector element defining at least said injector slot, said splash surface, and said aperture”. None of the cited art, either alone or in combination, teaches or fairly suggest an injector element that defines at least these portions.

Also, dependent Claim 22 recites “wherein said sheet of fuel substantially mixes with said stream of oxidizer before any portion of the fuel combusts”. Applicants submit that functional language can and should be given patentable weight. It is significant that a “patent Applicant is free to recite features of an apparatus either structurally or functionally.” In re Schreiber, 44 U.S.P.Q. 2d 1429, 1432 (Fed. Cir. 1997). Thus, functional features should be given patentable weight. Also see MPEP 2173.05(g). Further, Carlisle specifically teaches that the impingement plate 27 will only provide part of the fuel in an atomized manner while the remaining fuel is collected in the gutters 31 to be further combusted in the combustion area and not passed on burnt through the combustion chamber. Therefore, Carlisle does not appear to teach or fairly suggest that all of the fuel that is formed in a sheet is substantially mixed before it is combusted. Further, Carlisle does not appear to even indicate that the fuel is formed into a sheet, but rather simply impinges upon the impingement plate 27 to get mixed with air. Further, Shekelton et al. does not appear to teach or fairly suggest forming a sheet of fuel that substantially mixes with the stream of an oxidizer before any portion of the fuel

combusts. Shekelton does not appear to teach a stream of oxidizer in which a fuel can combust.

Therefore, Applicants submit that independent Claim 12 is in condition for allowance, as are each of the claims that depend directly or indirectly therefrom. Further, various of the dependent claims include patentable subject matter in and of themselves, which should be indicated as allowable.

Further, new independent Claim 35 recites “an injector slot, having a slot width; an aperture to allow the volume of the selected fuel from the fuel supply to leave said injector slots; a combustion chamber . . . wherein said aperture provides a hydraulic diameter of the selected fuel in said injector slot less than about 80% of said slot width.” Applicants submit that none of the cited art, either alone or in combination, teaches or fairly suggests each of the elements of independent Claim 35, including those recited above. Further, independent Claim 35 is of similar subject matter and breadth to the elected claims as it recites both an injector slot and a combustion chamber. Therefore, new independent Claim 35, and each of the claims that depend directly or indirectly therefrom, are part of the elected subject matter and should be considered herewith and each should be in condition for allowance.

Finally, new claim 46 should also be in condition for allowance. In particular, new Claim 46 recites “said injector slot includes a plurality of injector slots to form an elongated slot to spread the volume of fuel near a plurality of said oxidizer pathways.” Applicants submit that in none of the cited art, either alone or in combination, teach or suggest such a structure.

### **ALLOWABLE SUBJECT MATTER**

Applicants thank the Examiner for the indication of allowable subject matter in Claims 14 and 18-21. The Examiner states that claims 14 and 18-21 would be allowable if rewritten in independent form.

Claim 18 has been made independent by including each of the claims from which it originally depended. Therefore, amended independent Claim 18 and each of the claims that depend directly or indirectly therefrom are in condition for allowance.

Applicants have elected not to amend Claim 14 at this time, but reserve the right to amend Claim 14 into independent format in the future to make it allowable.

## CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: 11-29-05

By: 

Michael L. Taylor, Reg. No. 50,521

HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. Box 828  
Bloomfield Hills, Michigan 48303  
(248) 641-1600

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